6C Coalition Comment
September 5, 2024

The 6C Coalition files Comments in response to the Federal Communication Commission's (Commission) Public Notice (Notice) seeking comment on the Petition for Rulemaking (PR) of NextNav Inc. (NextNav).[1] The 6C Coalition is concerned the NextNav plan, if implemented, would interfere with and disrupt the business of toll collection across the country. For this and other reasons explained herein the 6C Coalition asks the Commission to deny the PR.

The 6C Coalition is a collaborative organization composed of toll facility operators/owners that use the International Organization for Standardization ("ISO") 18000-63 (commonly known as "6C") transponders as a primary method for automatic vehicle identification for the purpose of toll revenue collection. Started in 2012 with four toll agencies, the 6C Coalition has 49 member agencies across the US and Canada.

With National Interoperability mandated by the Moving Ahead for Progress in the 21st Century Act (MAP-21) in 2012, the toll industry transitioned to issuing and reading transponders using multiple protocols, 6C being one, to achieve national interoperability for all toll users in the US. The total investment for this transition was estimated to be $450 million (2014$) – the total investment in the infrastructure to support electronic toll collection is estimated in the billions. In the last year, over $700 million in toll revenue was collected using 6C technologies. As more agencies transition to 6C, revenue is expected to grow to greater than 50% of the US total toll market over the next decade. Tolling and toll revenue is critical to infrastructure in the US – it is used to fund the construction of new infrastructure, support the maintenance, rehabilitation, and improvement of existing infrastructure, and to manage congestion.

The 6C Coalition stewards the adoption and compliance of the ISO/IEC 18000-63 (known as 6C) communication protocol for tolling applications. The standard was adopted in 2010 with toll operators and manufacturers aligning with the non-Multilateration Location Monitoring Systems (non-M-LMS) sub-band within the 902-928MHz band.

As the Notice states, NextNav's April,16, 2024 PR requests the Commission reconfigure the Lower 900 MHz Band (Band) by creating a 5-megahertz uplink in the 902-907 MHz band paired with a 10-megahertz downlink in the 918-928 MHz band, shifting all the remaining non-M-LMS licensees to the 907-918 MHz portion of the Band. This would enable NextNav to build a terrestrial system (NextGen) to provide positioning, navigation, and timing (PNT) services. The bulk of the spectrum, however, would not be used for PNT. Rather NextNav plans to lease the bulk of the spectrum to a "partner" that would use the spectrum for 5G broadband.[2] According to NextNav, as little as two percent of the spectrum would be used to deploy a terrestrial PNT system, while up to 98 percent would carry 5G broadband services, via leasing arrangements with large 5G providers.[3] Furthermore, as currently written, NextNav is not required to deploy location-based services; they could use 100 percent for 5G broadband.

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[1] Wireless Telecommunications Bureau and Office of Engineering and Technology Seek Comment on NextNav Petition for Rulemaking WT Docket No. 24-240; RM-11989; DA 24-776, released August 6, 2024.

NextNav proposes to install 5G fixed and base station transmitters that are nearly three orders of magnitude more powerful than any other transmitter currently operating adjacent to the portions of the 900 MHz band allocated for tolling (non-M-LMS). These 5G fixed and base station transmitters will be communicating with handheld devices (cell phones) in vehicles and these cell phones will be communicating with the stations. The proximity of the 5G handheld devices to tolling technology could overwhelm individual 6C transponders making them unable to communicate with the roadside tolling equipment regardless of location. This would be a serious disruption to each toll agencies' ability to read vehicle toll tags and collect tolls.

Further, NextNav's proposal to narrow the allowable spectrum available for tolling does not include a guard band to protect users in 907-918MHz from interference. It is expected that, if the transponders are not completely overwhelmed, a guard band would be required in the remaining 907-918 MHz band, further constraining the public users of the lower 900 MHz band. With significantly less bandwidth available for *all* devices currently operating in the 902-928 MHz, interference between them is certain to increase – making it difficult to find unused frequencies for tolling locations to read toll tags reliably.

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[2] PR at p. 22-23 and n. 76.

[3] NextNav's CEO Mariam Sorond has said that NextNav "envisions its partner building a nationwide 5G network using NextNav's 15MHz chunk of spectrum in the 900MHz band. The partner would use the network for 5G, while NextNav would use it to offer nationwide PNT services. Sorond said NextNav's PNT offerings would consume roughly 2% to 5% of the network's total capacity." https://www.lightreading.com/5g/nextnav-s-ceo-explains-her-5g-network-buildout-plan

The PR makes numerous assertions about current usage on the band without evidence or input from the many entities that currently populate it. It further makes unsupported claims and assumptions about its proposed system and the protection of incumbent users. NextNav's outreach to the tolling industry has been limited. The company has not communicated or provided documentation on how it would protect toll collection systems or given any assurances that we could verify.

The impact of NextNav's proposal to operate powerful 5G transmitters in the 900 MHz band has not been comprehensively tested for impacts to tolling. During a May 7, 2024 meeting hosted by the International Bridge, Tunnel, and Turnpike Association (IBTTA)[4] and attended by NextNav, NextNav stated they had performed some preliminary testing with a tolling protocol used by the E-ZPass Group. However, NextNav did not share who performed the test, the scope and breadth of the test, or any detailed results from the test. At that meeting, NextNav stated they expected to have test results to share within two weeks. To date, no test results have been shared by NextNav.

To determine the magnitude of the impact of the NextNav proposal, NextNav and the tolling industry would need to complete comprehensive testing with all types of tags in use around the country (including 6C tags and tags using other tolling protocols), using equipment from multiple manufacturers, and including multiple toll gantry and/or canopy configurations. The testing should be multi-phase starting with lab testing, followed by controlled field testing (i.e. at a test track with actual vehicles), and ending with in-lane site testing. We anticipate it could require up to three years to create test plans acceptable to the consortium of tolling entities in the US, identify and schedule tests with lab facilities required, perform field testing, and validate the results. Testing of this magnitude is expensive and time-intensive; it is not an expense tolling agencies are prepared, nor should they be required, to carry.

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[4] The (IBTTA) is the worldwide association for the owners and operators of toll facilities and the businesses that serve them. Founded in 1932, IBTTA has members in 23 countries on six continents.

Tolling RFID devices are tuned to different frequencies on a site-by-site basis to avoid interference with existing operators identified during RF surveys of each location. Interference with other licensed and unlicensed operators in the lower 900 MHz band will be compounded when all the operators are forced into the 907-918 MHz band. As a result, even if NextNav performs controlled tests in coordination with tolling entities and demonstrate the impacts of their proposal are mitigatable, none of these tests can determine the impact once all the other devices currently operating in the lower 900 MHz band are concentrated in 907-918 MHz under the NextNav proposal.

Under the NextNav implementation, if interference occurs at an existing toll collection location (toll plaza), and the tolling entity has exhausted all available frequencies, the last resort for mitigation for toll collection in the 900 MHz band would be relocation of the toll plaza. If the NextNav proposal causes unmitigable interference at an existing toll plaza, relocating that toll plaza may not be possible without reconstruction of the roadway or relocation of the physical infrastructure. Assuming there is a viable alternate location, the relocation of an existing toll plaza would cost between $1 million and $25 million depending on the location and plaza configuration. There are over 12,000 toll lanes across the US that currently operate in the lower 900MHz band. As potential applications and deployment of NextNav's proposed 5G applications grow, toll operators could face not only the degradation of current locations but the inability to find suitable alternative locations with less interference.

Any proposed mitigation that relocates the tolling industry to other portions of the spectrum would be very disruptive and expensive. Again, to move to another part of the spectrum would require multi-year, multi-phase comprehensive testing. If the testing proves successful, all existing RFID equipment would have to be replaced as would every transponder currently affixed to vehicles across the country. This type of migration would require a coordinated effort between all tolling entities, public and private, in the US. Using the migration to the 6C protocol across the country as an indication, this type of migration would take over a decade and require a significant capital investment.

Interference caused by 5G cell phones operating in the 900MHz band could impede the ability to reliably and accurately collect tolls. It is our understanding that NextNav’s proposed technology is compatible with the existing 5G service operating in the 600MHz and 850MHz portions of the spectrum which have already large geographic coverage of the US. In addition, NextNav proposes to use the existing 5G protocols, adding the location service to the existing frequency bands would likely be much less costly than to add and deploy new infrastructure and update handsets to add the proposed frequency bands. NextNav could operate without significant impact and potential denial of service to the tolling industry and all the other users in the 902-928 MHz band.

The 6C Coalition believes significant capital and operational costs will be incurred if NextNav's plan is implemented. These impacts could fundamentally alter the ability to build and maintain infrastructure, accurately and reliably collect tolls, and would negatively affect the millions of users of these toll facilities.

On behalf of our members, the 6C Coalition respectfully asks the Commission to deny the NextNav Petition for Rulemaking.

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